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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/355,533	04/30/2014	Christopher L. Boyd	JMG001-01	3995

44070	7590	06/11/2018
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EXAMINER	
RUSSELL, DEVON L	

ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
06/11/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary**Application No.**
14/355,533**Applicant(s)**
BOYD ET AL.**Examiner**
DEVON RUSSELL**Art Unit**
3744**AIA (First Inventor to File)
Status**
No**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/9/18.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-16 is/are pending in the application.
5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) _____ is/are allowed.
- 7) ☒ Claim(s) 1-16 is/are rejected.
- 8) ☐ Claim(s) _____ is/are objected to.
- 9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____.
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 4) ☐ Other: _____.

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DETAILED ACTION

Claim Amendments

1. The claims dated 8/24/17 are entered. Claims 1 and 6 are amended. Claims 11-16 are newly entered. Claims 1-16 are pending and addressed below

Claim Rejections - 35 USC § 112

2. The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-10 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

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The metes and bounds of “adapted smoothly”, in claims 1 and 6, are not known. It is not clear what it means to adapt an item smoothly. Furthermore, if the intention was to read smoothly as modifying a different item of the claim, such as the following discussion of receiving, it is not clear what it would mean to receive the fluid smoothly as opposed to not smoothly. No guidance was located in the specification.

Claims 2-5 and 7-10 are also rejected for depending from claims 1 and 6.

Claim Rejections - 35 USC § 103

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-16 are rejected under pre-AIA 35 U.S.C. 103(a) as obvious over Best (US 2011/0132579) in view of JP 5956100 B1 ('100).

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Regarding claims 1 and 6, Best teaches an appliance immersion cooling system comprising: a tank (e.g. 510, 610, 710, 810) adapted to immerse (622, 722, 822) in a dielectric fluid (Para. [0025]) a plurality of electrical appliances (120), each in a respective appliance slot (Figs. 4, 6, 11) distributed vertically along, and extending transverse to, a long wall of the tank (L; e.g. Figs. 3-4), the tank comprising:

an outlet (e.g. 450, 550, heated liquid coolant outlet in Fig. 14, etc.) having an overflow lip (the bottom lip of the opening, interpreted as in the applicant's specification wherein the 'lip' is only the bottom surface of the opening 22), integrated horizontally into the long wall of the tank adjacent all appliance slots (see the long wall in each figure in which the weir is located), adapted to facilitate substantially uniform recovery of the dielectric fluid flowing through each appliance slot (Para. [0102]; the "common manifold area" defined by the tops of the slots and the devices 120, 820);

a primary circulation facility adapted to circulate the dielectric fluid through the tank (see 440/450, 540/550, etc.), comprising: a plenum, positioned adjacent the bottom of the tank, adapted to dispense the dielectric fluid substantially uniformly upwardly through each appliance slot (Para. [0086]; Figs. 5-6; H_L); a secondary fluid circulation facility adapted to extract heat from the dielectric fluid circulating in the primary circulation facility, and to dissipate to the environment the heat so extracted (150; 250; 350); and a control facility adapted to coordinate the operation of the primary and secondary fluid circulation facilities as a function of the temperature of the dielectric fluid in the tank (380, 370; Fig. 2, "temp data").

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Best does not teach the weir and reservoir arrangement.

'100 teaches an appliance immersion cooling system (see Figs.) with a weir (127) integrated horizontally into the long wall of the tank (see Fig. 4) adjacent all appliance slots (14) having an overflow lip (bottom lip of 127) adapted to facilitate substantially uniform recover of the dielectric fluid flowing through each appliance slot (Para. 0034 and 0036); and a dielectric fluid recovery reservoir positioned vertically beneath the overflow lip of the weir and adapted to receive the dielectric fluid as it flows over the weir (see reservoir in Fig. 2 attached directly behind and below the weir 127).

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the outlet of Best as the weir and reservoir, as taught by '100, in order to accommodate extra fluid displacement due to the insertion of additional electronic device and/or to allow for uniform removal of heated fluid from all appliance locations.

Best further teaches that: the tank and primary circulation facility comprise a highly integrated module (the devices are all inherently physically connected to one another and located in the same facility; see also Figs. 1B or 11), as per claims 2 and 7; interconnect panel facilities adapted to mount appliance support equipment (840), as per claims 3 and 8; first and second primary circulation sub-facilities (880 on the left/right of tank; e.g. Fig. 14), each adapted to operate independently to circulate the dielectric fluid through the tank (see Fig. 14), the control facility is further adapted to coordinate the operation of the first and second primary circulation sub-facilities and the secondary fluid circulation facilities to maintain the temperature of the dielectric fluid in

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the tank substantially between a predetermined minimum temperature and a predetermined maximum temperature (Para. [0082]), as per claims 4 and 9; and, the control facility (380) further comprises a communication facility (portion of controller which communicates with other equipment; Para. [0082] which performs the communications) adapted to facilitate monitoring and control of the control facility from a remote location (Para. [0081]-[0082]), as per claims 5 and 10.

Regarding claim 11, Best teaches a tank module adapted for use in an appliance immersion cooling system, the tank module comprising: a tank (e.g. 510, 610, 710, 810) adapted to immerse (622, 722, 822) in a dielectric fluid (Para. [0025]) a plurality of electrical appliances (120), each in a respective appliance slot (Figs. 4, 6, 11) distributed vertically along, and extending transverse to, a long wall of the tank (L; e.g. Figs. 3-4), the tank comprising:

an outlet (e.g. 450, 550, heated liquid coolant outlet in Fig. 14, etc.), adapted to facilitate substantially uniform recovery of the dielectric fluid flowing through each appliance slot (Para. [0102]; the "common manifold area" defined by the tops of the slots and the devices 120, 820);

a primary circulation facility adapted to circulate the dielectric fluid through the tank (see 440/450, 540/550, etc.), comprising:

a plenum, positioned adjacent the bottom of the tank, adapted to dispense the dielectric fluid substantially uniformly upwardly through each appliance slot (Para. [0086]; Figs. 5-6; HL);

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and a control facility adapted to coordinate the operation of the primary fluid circulation facility as a function of the temperature of the dielectric fluid in the tank (380, 370; Fig. 2, “temp data”).

Best does not teach the weir and reservoir arrangement.

‘100 teaches an appliance immersion cooling system (see Figs.) with a weir (127) integrated horizontally into the long wall of the tank (see Fig. 4) adjacent all appliance slots (14) having an overflow lip (bottom lip of 127) adapted to facilitate substantially uniform recover of the dielectric fluid flowing through each appliance slot (Para. 0034 and 0036); and a dielectric fluid recovery reservoir positioned vertically beneath the overflow lip of the weir and adapted to receive the dielectric fluid as it flows over the weir (see reservoir in Fig. 2 attached directly behind and below the weir 127).

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the outlet of Best as the weir and reservoir, as taught by ‘100, in order to accommodate extra fluid displacement due to the insertion of additional electronic device and/or to allow for uniform removal of heated fluid from all appliance locations.

Regarding claim 12, Best further teaches an interconnect panel facility (mounting support structures for 844; see Fig. 11) adapted to mount appliance support equipment (844).

Best further teaches that: first and second primary circulation sub-facilities (880 on the left/right of tank; e.g. Fig. 14), each adapted to operate independently to circulate

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the dielectric fluid through the tank (see Fig. 14), the control facility is further adapted to coordinate the operation of the first and second primary circulation sub-facilities and the secondary fluid circulation facilities to maintain the temperature of the dielectric fluid in the tank substantially between a predetermined minimum temperature and a predetermined maximum temperature (Para. [0082]), as per claim 13; and, the control facility (380) further comprises a communication facility (portion of controller which communicates with other equipment; Para. [0082] which performs the communications) adapted to facilitate monitoring and control of the control facility from a remote location (Para. [0081]-[0082]), as per claim 14; the tank is part of an appliance immersion cooling system (see Figs.), per claim 15; and a secondary fluid circulation facility (250, 290; 352, 354) is adapted to extract heat (in 280) from the dielectric fluid circulating in the primary circulation facility and to dissipate to the environment the heat so extracted (Para. [0072]), per claim 16.

Response to Arguments

7. Applicant's arguments with respect to claims 1-16 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

The applicant simply argues that the EPO examiner did not agree with the application of Best in view of Pfannl. The examiner disagrees that the claims presented differentiate over Best in the manner indicated by the EPO examiner. The EPO

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examiner appears to read into the claim language additional unclaimed features from the specification, which is not proper in the U.S.

Notwithstanding all of the above, the claims are currently rejected under different art as necessitated by the amendments to claims 1 and 6 and therefore the remarks are not persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVON RUSSELL whose telephone number is (571)270-1858. The examiner can normally be reached on M-Th, 9-4.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor is Ned Landrum. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEVON RUSSELL/
Primary Examiner, Art Unit 3744